Trend Study 16B-10-02

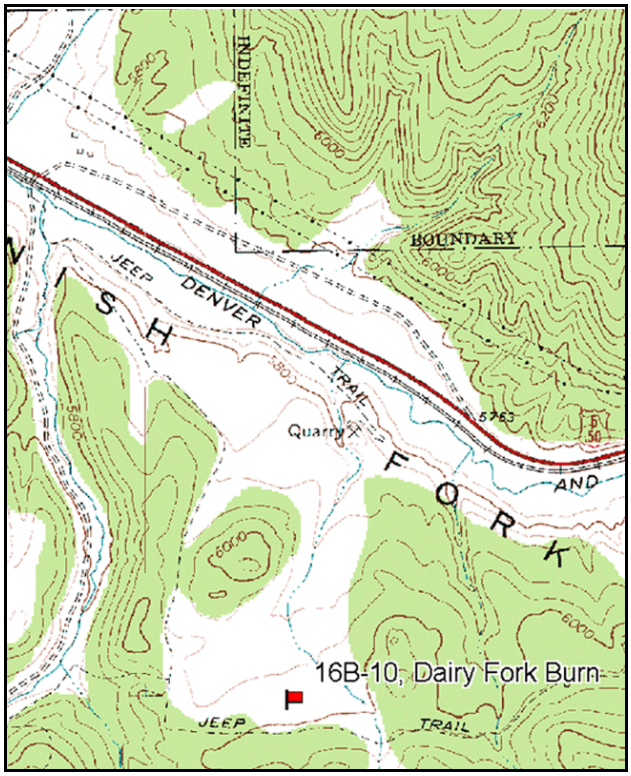
Study site name: Dairy Fork Burn . Vegetation type: Big Sagebrush-Burn .

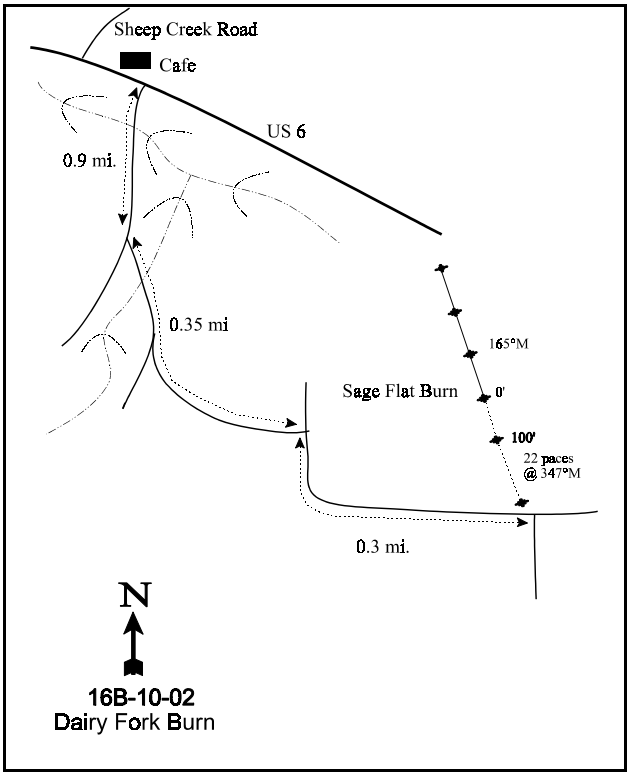
Compass bearing: frequency baseline 165 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Near the Sheep Creek cafe on Highway 6, take Dairy Fork Road on the south side of the highway 0.9 miles to a left hand fork. Take this fork, cross the creek and go 0.35 miles staying east (left) to a sagebrush flat/burn and a 3-way intersection. Turn right (south) and follow the road around upper edge of flat for 0.3 miles to a junction on the right and a witness post on the left. Stop here and walk north into the flat about 22 paces at an azimuth of 347 degrees magnetic to the l00-foot baseline stake.





Map Name: Mill Fork

Diagrammatic Sketch

Township 15S ,Range 5E , Section 7

GPS: NAD 27, UTM 12S 4422921 N 471997 E

DISCUSSION

Dairy Fork Burn - Trend Study No. 16B-10

The Dairy Fork Burn study samples a burned sagebrush flat surrounded by juniper. The site has an elevation of 6,000 feet with a gentle 3% slope to the north. This Division property was burned and seeded in 1988, resulting in the big sagebrush population being largely eliminated within the flat. A 1978 line-intercept transect ran across the lower, north end of the flat where a disc-chain was used for preparing a seedbed. A trend study was established in 1989 to monitor recovery on this basin big sagebrush (*Artemisia tridentata tridentata*) site. Use of the site by big game is light by deer and moderate to heavy by elk. Quadrat frequency of pellet groups in 1997 was 33% for elk and 9% for deer. Quadrat frequency in 2002 increased to 46% for elk and 13% for deer. Pellet group transect data taken in 2002 estimated 116 elk days use/acre (288 edu/ha) and only 5 deer days use/acre (13 ddu/ha). About one-third of the elk pellet groups encountered appear to be from spring use. Domestic sheep had been trailed through the area just prior to the site being read in 2002. Sheep use was estimated at 34 days use/acre (84 sdu/ha).

Soils at the site have moderate depth and the effective rooting depth is estimated at nearly 14 inches. Soil texture is a clay and reactivity is slightly alkaline (pH of 7.4). The high clay content (dense compact soil) limited soil penetrometer readings. Phosphorus levels (8 ppm) are slightly lower than the 10 ppm determined as necessary for normal plant growth and development. There is a high amount of exposed bare soil (averages 41% between all readings) which translates into high erosion potential. However, due to the gentle slope, erosion is minimal on the study site. Other areas of the flat without herbaceous cover display significant soil movement. An erosion condition class assessment determined the probability of erosion to be slight in 2002.

When this study was established in 1989, no density plots were established to estimate sagebrush density. In 1997, sagebrush density was estimated at 300 plants/acre, increasing to 480 plants/acre in 2002. Recruitment from the young age class was high in 1997 at 40%, and moderately high in 2002 at 21%. Decadent plants were first sampled in 2002, with only 13% of the population being classified as such. Vigor is mostly normal throughout the limited big sagebrush population in all years. Big sagebrush increased in average cover and strip frequency in 2002, supporting the increased density estimate. It should be noted that the dead sagebrush plants listed in the browse characteristics table in 1997 and 2002 were plants that existed in the original population before the burn treatment. Use on sagebrush has been mostly light in all readings. Sagebrush annual growth was estimated at nearly 3 inches in 2002.

Musk thistle was the dominate herbaceous species in the treated area in 1989. However, this undesirable weed was infested with a weevil and there was little viable seed. Musk thistle has steadily declined to where none was sampled in 2002. Native and seeded perennial grasses were diverse but not abundant when the site was established in 1989. By 1997, sum of nested frequency of perennial grasses increased dramatically (95 to 569). With drought in 2002, sum of nested frequency for perennial grasses slightly decreased to 462. Crested wheatgrass is the dominate species on the site, contributing nearly three-fourths of the grass cover, and over 60% of the total vegetation cover on the site in 2002. Other grasses that occur in lower frequencies include intermediate wheatgrass, smooth brome, and bottlebrush squirreltail. With the exception of squirreltail, grasses had been moderate to heavily utilized by domestic sheep when the site was read in June 2002. Since site establishment, sum of nested frequency for forbs has steadily declined due to a significant reduction in the frequency of two weedy species, musk thistle and prickly lettuce. Drought in 2002 also likely played a role in decreased nested frequency of perennial forbs. Whitetop, a noxious weed, was sampled on the site in 2002. Two seeded forbs, small burnet and alfalfa, were sampled in 1997 in low frequency, but neither were present in 2002.

1989 APPARENT TREND ASSESSMENT

Vegetation condition is improving after the burn as herbaceous perennials and sagebrush reoccupy the treated flat. Soils will improve as the vegetative community becomes established, especially from perennial species. Soil erosion is not serious on the study site due to the gentle slope.

1997 TREND ASSESSMENT

The soil trend is considered stable. Percent bare ground increased slightly from 38% to 44% and litter cover declined. However, sum of nested frequency for perennial grasses increased sixfold. Erosion is not currently a problem on the site. Trend for sagebrush is up, but the population remains limited. Young plants make up 40% of the age class, use is light, and there are no decadent plants. Trend for the herbaceous understory is up. Sum of nested frequency for grasses increased sixfold, while nested frequency of forbs declined due to a reduction in musk thistle and other weedy forbs.

TREND ASSESSMENT
soil - stable (3)
browse - up for big sagebrush (5)
herbaceous understory - up (5)

2002 TREND ASSESSMENT

Trend for soil is stable. Bare soil remains high, but slightly decreased in 2002. Litter cover improved over 1997 levels with minimal erosion occurring. Trend for big sagebrush is slightly up as density continues to slowly improve. Young plants make up 21% of the population which is very good especially during a drought year. Use remains light, and decadency is low at 13%. Trend for the herbaceous understory is slightly down. Sum of nested frequency for perennial grasses declined by 19%, and sum of nested frequency for perennial forbs declined by 81%. The decrease in frequency of perennial forbs came mostly from the decline in musk thistle, so this decline is not all negative.

TREND ASSESSMENT
soil - stable (3)
browse - slightly up (4)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Herd unit 16B, Study no: 10

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
G	Agropyron cristatum	a11	b209	c285	6	70	92	8.24	15.97
G	Agropyron intermedium	a1	b108	b85	1	38	32	5.00	4.20
G	Bromus inermis	a1	b86	b50	1	32	22	2.21	.58
G	Bromus tectorum (a)	-	b132	a18	-	50	6	.88	.32
G	Dactylis glomerata	9	10	2	6	4	1	.09	.00
G	Oryzopsis hymenoides	a1	ab6	b15	1	3	7	.56	.31
G	Poa fendleriana	1	-	-	1	-	-	-	-
G	Poa pratensis	a2	b27	a-	1	10	-	.53	-
G	Poa secunda	a-	b5	a-	-	5	-	.12	-
G	Sitanion hystrix	b69	c118	a25	33	52	10	2.71	.90

Type	Species	Nested Frequency			Quadrat Frequency			Average Cover %	
		'89	'97	'02	'89	'97	'02	'97	'02
Total for Annual Grasses		0	132	18	0	50	6	0.88	0.31
Total for Perennial Grasses		95	569	462	50	214	164	19.49	21.97
Total for Grasses		95	701	480	50	264	170	20.38	22.29
F	Achillea millefolium	3	4	5	1	1	2	.63	.03
F	Alyssum alyssoides (a)	-	6	6	-	3	2	.01	.03
F	Astragalus cibarius	3	-	-	2	-	-	-	-
F	Astragalus convallarius	$_{c}$113	$_{b}$62	$_{a}$3	53	26	1	.46	.00
F	Astragalus tenellus	$_{b}$9	$_{ab}$5	$_{a}$-	5	3	-	.04	-
F	Cardaria draba	$_{a}$-	$_{a}$-	$_{b}$16	-	-	7	-	.04
F	Camelina microcarpa (a)	-	$_{b}$42	$_{a}$-	-	21	-	.13	-
F	Carduus nutans (a)	$_{c}$230	$_{b}$106	$_{a}$-	91	46	-	3.23	-
F	Chaenactis douglasii	$_{b}$145	$_{a}$25	$_{a}$4	67	11	2	.05	.01
F	Cirsium spp.	-	3	-	-	1	-	.03	-
F	Comandra pallida	$_{a}$-	$_{b}$36	$_{a}$-	-	14	-	.56	-
F	Collinsia parviflora (a)	-	2	-	-	1	-	.00	-
F	Descurainia pinnata (a)	-	2	-	-	1	-	.00	-
F	Epilobium brachycarpum (a)	-	5	-	-	2	-	.01	-
F	Grindelia squarrosa	6	-	-	2	-	-	-	-
F	Lactuca serriola	$_{c}$217	$_{b}$32	$_{a}$-	81	14	-	.14	-
F	Machaeranthera canescens	5	-	-	3	-	-	-	-
F	Medicago sativa	-	1	-	-	1	-	.03	-
F	Microsteris gracilis (a)	-	$_{b}$58	$_{a}$27	-	24	10	.36	.05
F	Penstemon caespitosus	7	13	14	3	5	5	.74	.22
F	Phlox longifolia	-	3	2	-	1	1	.00	.00
F	Ranunculus testiculatus (a)	-	4	-	-	1	-	.00	-
F	Sanguisorba minor	5	9	-	4	4	-	.16	-
F	Sisymbrium altissimum (a)	-	5	-	-	3	-	.01	-
F	Taraxacum officinale	11	8	-	3	4	-	.07	-
F	Tragopogon dubius	$_{c}$23	$_{b}$8	$_{a}$-	13	6	-	.05	-
F	Vicia americana	$_{a}$-	$_{b}$24	$_{a}$-	-	9	-	.04	-
Total for Annual Forbs		230	230	33	91	102	12	3.78	0.08
Total for Perennial Forbs		547	233	44	237	100	18	3.03	0.31
Total for Forbs		777	463	77	328	202	30	6.82	0.39

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 16B, Study no: 10

Type	Species	Strip Frequency '97	Strip Frequency '02	Average Cover % '97	Average Cover % '02
B	Artemisia tridentata tridentata	13	19	.41	1.86
B	Chrysothamnus nauseosus	0	1	-	-
B	Juniperus osteosperma	1	0	.15	.63
Total for Browse		14	20	0.56	2.50

Key Browse Annual Leader Growth
Herd unit 16B , Study no: 10

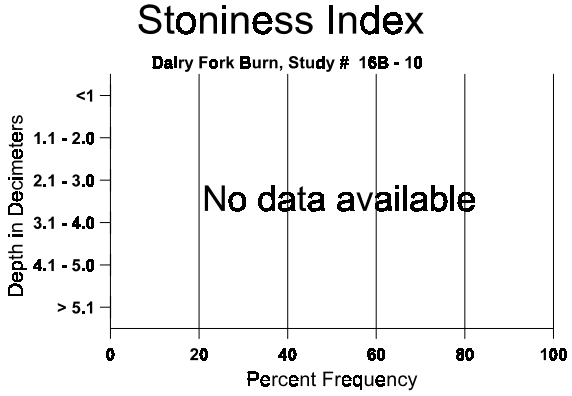
Species	Average leader growth (in) '02
Artemisia tridentata tridentata	2.9

BASIC COVER --
Herd unit 16B, Study no: 10

Cover Type	Nested Frequency '97	Nested Frequency '02	Average Cover % '89	Average Cover % '97	Average Cover % '02
Vegetation	351	339	4.00	32.15	25.91
Rock	3	5	0	.00	.01
Pavement	92	30	0	.22	.06
Litter	379	387	58.25	24.80	49.02
Cryptogams	5	7	0	.16	.03
Bare Ground	350	321	37.75	43.81	41.40

SOIL ANALYSIS DATA --
Herd Unit 16B, Study no: 10, Dairy Fork Burn

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
13.7	59.0 (13.2)	7.5	25.4	26.8	47.8	2.2	8.0	217.6	.4



PELLET GROUP FREQUENCY --
Herd unit 16B, Study no: 10

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	'02	'02
Sheep	-	11	444	34 (84)
Rabbit	12	8	-	-
Elk	33	46	1514	116 (288)
Deer	9	13	70	5 (13)
Cattle	1	-	-	-

BROWSE CHARACTERISTICS --
Herd unit 16B, Study no: 10

AGE	YR	Form Class (No. of Plants)									Vigor Class				Plants Per Acre	Average (inches)		Total
		1	2	3	4	5	6	7	8	9	1	2	3	4		Ht.	Cr.	
Artemisia tridentata tridentata																		
S	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	6	-	-	-	-	-	-	-	-	6	-	-	-	120			6
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100			5
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	9	-	-	-	-	-	-	-	-	8	-	1	-	180	49	43	9
	02	11	3	2	-	-	-	-	-	-	16	-	-	-	320	33	30	16
D	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	3	-	-	-	-	-	-	-	1	-	1	1	60			3
X	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	2360			118
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	1280			64

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'89	00%	00%	00%	
'97	00%	00%	07%	+38%
'02	25%	08%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'89	0	Dec:	0%
	'97	300		0%
	'02	480		13%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus nauseosus																		
M	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	1	-	-	-	1	-	-	-	20	24	27	1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	100%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)				
'89	0	Dec:	-
'97	0		-
'02	20		-

Juniperus osteosperma																		
Y	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor
'89	00%	00%	00%
'97	00%	00%	00%
'02	00%	00%	00%

%Change

Total Plants/Acre (excluding Dead & Seedlings)			
'89	0	Dec:	-
'97	20		-
'02	0		-